UNIJERPS
Unizik Journal of Educational Research and Policy Studies VOL.18 (3);
July-December, 2024 https://unijerps.org
2023 Impact Factor: **6.834;** 2022 ***Impact Factor***: 5.156; ***2021 Impact Factor: 5.641;***
2020 Impact Factor: 5.355. *Indexing and Impact Factor URL: http://sjifactor.com/passport.php?id=21363*

ASSESSMENT OF TEACHERS' PROFESSIONAL DEVELOPMENT FOR AI INTEGRATION IN TEACHING

Maureen O. Okoh
Federal University Oye
Department of Educational Foundations
Oye, Ekiti State
maureen.okoh@fuoye.edu.ng; 08035089926

&
Solomon S. Alamu
Department of Vocational and Technical Education Ekiti State University, Ekiti State
solomonalamu@gmail.com ; 08035335647

ABSTRACT
The changes in the way technology are used globally have impacted all sectors of development including education. However, the professionals saddled with the responsibility of imparting the learners are often not abreast with the realities of the changing technologies available for improving the teaching learning process. The teachers in their professional development are deprived on relevant skills that can easily support and enhance effectiveness in the work place. While the advanced nations are enhancing the teaching processes with AI, the developing nations are mainly on geared towards the implementation of advanced technology as AI because of infrastructure, funding and skills of experts. This study used systematic method to determine the secondary sources of information to assess the teachers' professional development for AI integration in teaching. The study revealed that AI is changing the face of education through its application in the society and possess many advantages that should be explored by teachers. Conclusion was based on researchers' findings from the reviewed studies on teachers' professional development for AI integration in teaching. The study recommends that teachers should be exposed to the benefits of AI through workshops, trainings should be done for skill acquisition, among others.

Keywords: Artificial Intelligence, Nigeria, Teachers' Professional Development, Education, Teaching

Introduction
Artificial Intelligence (AI) is a technology that is becoming a dominant force in every sector of the world, however while the educational sector is adopting AI for enhancing the learning experience, many of the educators appears to still be ignorant in the use of this technology in their institutions and classrooms for teaching the students. This could be as a result of limitation in the competence ability of the

educators or due to the shortcomings in relationship to the professional development of the teachers. According to Fakhar et al. (2024) the AI field has seen great development in various segments of the world, which comprise the educational sector. This development is observed to have enhanced security through the technologies of facial recognition, improved learning through automated and quick responses innovation, assisted in automation of machines like drones usage in agriculture, among others. Therefore, bringing in a new life in the way things are done around the world when compared to the pre technological era where things are majorly hinged on personal interaction for teachers to carry out the teaching and learning processes when teaching learners. However, with the advent of technology teaching and learning approaches has changed tremendously with the increases in usage of diverse innovations including AI around the world. Other scholar has acknowledged that AI has the potential to transform teaching by presenting innovative tools and practices (Zhang & Aslan, 2021; Yildirimet al., 2022; Kumar, 2023). This prospects holds the tendency for improve educational procedures which can augment the education practice (Dua, 2021; Crompton & Burke, 2023).

Education sector is observed to be a contributor to economic development of nations and could be stated as the bedrock upon which fundamental issues are resident for success in the society. Therefore, if the custodian of impacting the education needed are lacking in a relevant aspect of development it would spill over to the society. Though, this seems to be substantial but nations where the teachers are trained under a better technological professional development like is observable in advanced nations as United Kingdom and United States to mention a few has shown remarkable achievement in the growth of their society.

From the varied studies on teachers' professional development, the assessment on AI for their professional development has scarcely been measured by scholars in relation in education. Thus, this study will discuss teachers' professional development, its relationship to the novel technology called AI, benefits of AI to education and how teachers' professional development with AI can be enhanced.

Concept of Artificial Intelligence (AI)

Diverse scholars had previously tried to provide the most suitable definition for AI (Gwagwa et al., 2020; Kengam, 2020) while other scholars have given varied studies where AI was introduced for the application of humanity in improvement of their development. Scholar as Fakhar et al. (2024) examined the integration of AI in the continuous professional development (CPD) of teachers to understand a comprehensive idea on its prospective capacity to enrich the value of CPD programs on the global front. Also studies to evaluate the integration of AI for teachers' professional development had been done in Africa (Fakhar et al., 2024). In defining what AI should be referred to represent, there is no universal definition

because many scholars had previously tried to define AI from their own viewpoints. However, according to Cooper (2023) Artificial intelligence (AI) is the replication or simulation of human intelligence in machine automated to reason and learn like humans. Although, Fakhar et al. (2024) related the tasks of AI to include learning, thinking, problem-solving, awareness, language understanding, dialogue recognition, among other capabilities. Simply AI can be defined as the development of workstations that possess the means of carrying out duties which can be done with an intelligence that is considered as similar to human.

Advantages of AI in Education

Artificial Intelligence has enormous advantages when put into appropriate use by teachers, educational stakeholders and the government, however this study summarized the following benefits as relevant to education:

1. Oniovoghai et al. (2023) emphasize that AI is useful in the librarian section of the education for the functioning of their services.
2. Using AI can enable the teachers to have more time for themselves because the technology can be automated for use for the learners. Invariably reducing the stress on the teachers.

In view of all the benefits that can be derive from employing these technologies, some of the transforming learning environment will be discussed to elicit the impact over time.

Changing Educational technologies for Teaching

Scholars had previously used diverse novelties or innovation in the teaching of learners around the world to investigate the effectiveness of those innovations on the teaching learning process and knowledge (Sung et al., 2016; Onasanya et al., 2019; Sobowale et al., 2020; Famiwole & Ajibare, 2021). However, despite the changing efforts by scholars to incorporate this ideas into the learning process, the effectiveness on each of the technologies applied in improving education has shown improvement in learners learning ability from the studies carried out (Jain & Jain, 2019; Suarez-Lantaron et al., 2022; Sobowale et al., 2020), showing the usefulness of technology in this present time for knowledge seeking individuals and those engaged in impacting of the knowledge. Neha (2020) assert that AI in education has created effective environments where learning can be done whereby enhancing student's interaction. In Nigeria, the use of AI by teachers is scarce and hardly could an institution of professional development for teachers claim they are practically utilizing this technology in the training of their learners. However, diverse studies on AI were previously investigated in Nigeria (Ade-Ibijola & Okonkwo, 2023; Oniovoghai et al., 2023).

Assessment of Teachers' professional development for AI integration in teaching

Education continue to experience modification in the way or practice and the

teaching learning process due to diverse integration of technologies as mobile technologies, block chain, machine learning, AI, among others. However, the training of the teachers for professional competency in their developmental form for the incorporation of these technologies are hardly emphasized in many of the developing nations because of lack of adequate facilities, poor funding, motivation problems, moribund infrastructures, and over dependence on the traditional method of teaching. The traditional approach of teaching have obviously been disrupted by the utilization of technologies over the years, however the use of AI is in the embryonic stage of development in training of teachers in many institutions, especially in developing nations.

AI integration in the teaching profession is novel, however not new in advance nations that has taken the bull by the horn in integrating technology in every aspects of their operations. Emphasis on professional development, training, and support for teachers with AI technologies hardly have been reviewed (Van Leeuwen et al., 2014; Rienties and Toetenel, 2016). In a related study, Van Leeuwen et al. (2023) opine that teacher professional with advanced technology as AI has modify the environment where learners learn.

Challenges of Integrating AI in Schools

There are various challenges surrounding the integration of AI into Nigerian schools as noted by Ade-Ibijola and Okonkwo (2023), Onyejegbu L.N. (2023), and Gwagwa et al (2020). Some of which includes

- Lack of Adequate Professional Training and support for teaching:
  The training of teachers on the use of innovative technological tools is hardly emphasized. Most teachers are not aware on the use of AI tools in teaching while others may lack the competence on the utilization of existing technological tools for effective learning outcomes.
- Lack of well-equipped technological infrastructure:
  Well-equipped Laboratories, electricity and Internet are very important in the implementation of teaching and learning of Al in schools. Unfortunately most schools do not have adequate infrastructure for effective engagement of students with advanced technology.
- Lack of AI rules of ethics:
  AI technologies and their applications raise ethical issues which requires experts in AI ethic fields to guide Educators on the right tools to work with. However, the scarcity of enough experts in field have left most teachers mistrust its integration in the school system.

Methodology

AI possess a lot for educators when properly harnessed by those engaged in the education sector in the teaching learning process. This study is a review on the professional development of teachers using secondary sources of information to establish the level

of the integration existing in institutions by teachers, the influence causes the adaptation and areas where the integration had been taking place by teachers in the educational sector. Assessment were established on reports of scholars, use of journals of education, journals on technology, journals of social and behavioral sciences and other appropriate journals with evidence that could be understood for the study using keywords as artificial intelligence, teachers' professional development, digital technologies in education, Nigerian education, teaching, digital Technologies and teacher training. The varied selected reports, studies and records used were listed in a chronological form in the references provided.

Findings

From the diverse scholars reviewed and the professional development of teachers around the world, this study has identified that there is need for a more improved awareness on teaching the teachers during their trainings on the practicability of technology as AI in education and how effective the teachers could inculcate the innovation towards enhancing student's learning experience with performance. In addition, it is pertinent to state the use of AI possess benefits which is relevant on improving student's performance outcome and interest. These are key factors which the teaching learning process in other studies have indicated as germane for acquiring knowledge. The assessment on AI for teachers' professional development is observed as important on what direction of successes or otherwise student's achievement would be guided because of the growing influence the use of AI is having on the world at large and the prospects of what it holds when education and educators are not abreast of its reality.

Suggestions

The deduction from this study is that teachers' professional development had been changing over time, however the usage of AI for the delivery of the teaching learning process by educators needs professional development in many nations. While it could be emphasized that teachers' professional development is a continuous process, the utilization of advanced technology as AI worldwide in the teaching process cannot be generalized presently. Therefore, it is imperative from the study for the adaptation and adoption of AI because of the enormous advantages for teaching thus, the following suggestions for enhancing teachers' professional development for AI integration in teaching could be considered:

i. The teachers should be exposed to the benefits of AI to improving and easing their teaching process. This can be achieved by the educational stakeholders and educational institutions having workshops and conferences to create better awareness on the advantages inherent in the use of AI in education.
ii. Teachers that lack the competence in the use of existing technologies should be trained practically by experts to keep them abreast of the realities of the modern time of digitalization around the world. It is vital because someone that lack the elementary or primary skills of

the utilization of existing technologies will obviously find it difficult in understanding how to appropriately inculcate high tech innovation as AI into their teaching for students.

iii. It is pertinent that educational institutions should consider the need to collaborate with other technological establishments or institutions advancing teaching by the usage of AI in order to enable organizations lacking the expertise to learn and be mentored by those with know-how for innovative ideas as AI for teachers in instructing processes.

iv. The education stakeholders should consider upgrading the infrastructure that are in use for teachers' professional development to technologies that can enable the trainee teachers to acquire valuable skills for training as teachers.

v. Experts should be engaged who understand how to evaluate the impact of AI on our society, particularly in terms of learning how to work effectively with AI systems and harness them for good. These experts should train the trainer on how to integrate ethics into classroom.

Conclusion

Technology continue to change the ways things are achieved globally, however the professionals involved in the teaching and learning processes like teachers are gradually adopting and adjusting to the previous innovations utilization in technology and does not appear to have taken the usage of AI as a tool to enhance their professional development. However, sophisticated tools as AI for the teaching and learning process could still be referred to as being in the beginning stages of practice in many nations around the world, especially in developing countries. Like in the case of Nigeria, while there are increases in the utilization of technologies in the teaching learning processes, a lot should be done because of the close attachment to the traditional method of teaching as the lecture methods in many of the institutions of learning.

The exposures from this study elicit that Nigerian scholars are already experimenting with advanced technology in their teaching learning processes, however, notwithstanding the changes in the educational sector, assessment of teachers' professional development for AI integration in teaching is somewhat low. This could be attributed to the challenges with AI use in teaching and learning also continual dependence on the traditional methods of teaching as face to face teaching interaction majorly. Therefore, adopting innovation as application of AI to teaching can be a buddle to those attached to the old fashioned classroom method of talk and chalk method for learning. In conclusion, the study emphasize that changing approaches to teaching globally require teachers improving on their technological skills.

REFERENCES

Ade-Ibijola, A. & Okonkwo, C. (2023). Artificial Intelligence in Africa: Emerging Challenges. In Eke, D. O., Wakunuma, K. & Akintoye, S., Responsible AI in Africa: Challenges and Opportunities. *Social and Cultural Studies of Robots and AI, 101-117, Palgrave Macillian.* https://doi.org/10.1007/978-3-031-08215-3

Cooper, G. (2023). Examining Science Education in ChatGPT: An Exploratory Study of Generative Artificial Intelligence. *J. Sci. Educ. Technol*., 32(3), 444–452. doi: 10.1007/s10956-023-10039-y.

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. *International Journal of Educational Technology in Higher Education, 20*(1), 22. https://doi.org/10.1186/s41239-023-00392-8

Dua, A. (2021). Applications of Artificial Intelligence in Open and Distance Learning, *TechnoLearn Int. J. Educ. Technol.*, 11. doi: 10.30954/2231-4105.02.2021.1.

Fakhar, H., Lamrabet, M., Echantoufi, N., El khattabi, K., & Ajana, L. (2024). Towards a New Artificial Intelligence-based Framework for Teachers' Online Continuous Professional Development Programs: Systematic Review. *International Journal of Advanced Computer Science and Applications (IJACSA),* 15(4), 480-493.

Famiwole, R. O., & Ajibare, A. Y. (2021). Effects OF Computer-based and Jigsaw Methods on Senior Secondary School Students' Learning Outcomes in Agricultural Science in Ekiti State, Nigeria. *Global scientific journal (GSJ),* 9(2), 791-799.

Gwagwa, A., Kraemer-Mbula, E., Rizk, N., Rutenberg, I. & De Beer, J., 2020. Artificial intelligence (AI) deployments in Africa: benefits, challenges and policy dimensions. *The African Journal of Information and Communication*, 26, 1–28.

Jain, S., & Jain, R. (2019). Role of artificial intelligence in higher education- an empirical investigation. *International Journal of Research and Analytical Reviews.* 6(2), 144-150.

Kengam, J. (2020). Artificial Intelligence in Education. DOI:10.13140/RG.2.2.16375.65445

Kumar, A. H. S. (2023). Analysis of ChatGPT tool to assess the potential of its utility for academic writing in biomedical domain. *BEMS Reports, 9*(1), 24-30. https://doi.org/10.5530/bems.9.1.5

Neha, K. (2020). Role of Artificial Intelligence in Education. *Alochana Chakra Journal*, 9(4), 305- 309.

Onasanya, S. A., Nuhu, K. M., Oladipupo, M. O., Samuel, N., & Ishola, A.O. (2019). Effectiveness of Chemistry Learning-App for Nigerian Undergraduates in a Blended Learning Environment. *Al-Hikmah Journal of Education*, 6(1), 76-83.

Oniovoghai, E.M., Idiodi, E.O., & Urhiewhu, L.O. (2023). Artificial Intelligence (AI) In Service Delivery to Academic Library by Librarians in Nigeria,

International Journal of Library and Information Science Studies, 9(2), 41-53.

Onyejegbu, Laeticia .N. (2023). Challenges of Integrating AI Ethics into Higher Education Curricula in West Africa: Nigerian Universities Narrative. 10.1007/978-3-031-23035-6_5. In book: AI Ethics in Higher Education: Insights from Africa and Beyond (pp.57-66)

Rienties, B., and Toetenel, L. (2016). The impact of learning design on student behaviour, Satisfaction and performance: a cross-institutional comparison across 151 modules. Comput. Human Behav. 60, 333–341.

Sobowale, F. M., Chukwuemeka, E. J., Babatunde, A. E., & Dominic, S. (2020). Effects of A Tutor Platform on Learning Outcomes in Agricultural Science among University Students in North-Central, Nigeria. *European Journal of Interactive Multimedia and Education*, 1(1), 1-6.

Suarez-Lantaron, B., Deocano-Ruiz, Y., Garcia-Perales, N., & Castillo-Reche, I. S. (2022). The Educational Use of WhatsApp. *Sustainability*, 14, 10510. https://doi.org/10.3390/su141710510

Sung, Y.T., Chang K.E., & Liu T.C. (2016).The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers and Education*. 94, 252 -275.

Van Leeuwen, A., Strauß, S., and Rummel, N. (2023). Participatory design of teacher dashboards: navigating the tension between teacher input and theories on teacher professional vision. Front. Artif. Intell. 6, 1039739. doi: 10.3389/frai.2023.1039739

Van Leeuwen, A., Janssen, J., Erkens, G., and Brekelmans, M. (2014). Supporting teachers in guiding collaborating students: effects of learning analytics in CSCL. Comp. Educ. 79, 28–39. doi: 10.1016/j.compedu.2014.07.007

Yildirim, B., Akcan, A. T., & Ocal, E. (2022). Teachers' Perceptions and Stem Teaching Activities: Online Teacher Professional Development and Employment. *J. Balt. Sci. Educ*., 21(1), 84–107. doi: 10.33225/jbse/22.21.84.

Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research & future directions. *Comput. Educ. Artif. Intell.*,2, 100025. doi: 10.1016/j.caeai.2021.100025.